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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/557,190	11/18/2005	Lutz Rose	HM-657PCT	7251

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EXAMINER	
CHEN, CHRISTINE	
ART UNIT	PAPER NUMBER
4116	
MAIL DATE	DELIVERY MODE
01/23/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/557,190	ROSE ET AL.	
	Examiner	Art Unit	
	CHRISTINE CHEN	4116	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 November 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/18/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Application

Claims 1-11 are pending and presented for examination.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on November 18, 2005 was filed. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
(f) BACKGROUND OF THE INVENTION.
    (1) Field of the Invention.
    (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(g) BRIEF SUMMARY OF THE INVENTION.

(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(i) DETAILED DESCRIPTION OF THE INVENTION.
(j) CLAIM OR CLAIMS (commencing on a separate sheet).
(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2, 3, 5 and 6 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-6, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Görnerup (WO 00/14287 hereinafter A1).

Claim 1 is drawn to a method for producing foamed slag on high-chromium melts in an electric furnace.

Görnerup (A1) teaches a method for the production of bulk molten high-Cr steel (p. 7, li. 5-11) in an electric arc furnace comprising the formation of a foaming top slag.

While Görnerup (A1) discloses that "foamy slag practice according to known techniques comprises the injection of oxygen as well as carbon and/or carbon carriers" (p. 1, li. 32-33), in Görnerup's invention (A1), oxygen supply in the forms of oxygen gas and/or other oxygen carriers such as metallic oxides are acceptable (p. 1, li. 8-9). Therefore the introduction of a mixture of metallic oxide and carbon to a furnace is simply the combining of prior art elements according to known methods to yield predictable results. Furthermore, it is known in the art that the oxides are reduced by the carbon. "CO/CO_2 (g) is formed during the reduction phase, and the gas-slag emulsion forms a foam" (p. 1, li. 34-35). In addition, based on the Görnerup reference (A1), it would have been obvious to one of ordinary skill in the art that the mixture of metal oxide and carbon is introduced into the furnace as compressed performs. In the Görnerup reference (A1), Görnerup (A1) teaches a doping agent, which "participates in the reduction process, contributing to and/or maintain foaming of the top slag (p. 1, li. 21)." Görnerup (A1) teaches the doping agent to be introduced into the furnace in a preform, particularly a granulate (p. 4, li. 11). This being the case, it would have been obvious that the mixture of the metallic oxide and carbon also be introduced as a preform, as they perform very similar functions. Furthermore, it would be convenient that the metallic oxide and carbon are compressed performs being that the compression would aid in the reaction between the oxide and carbon.

In regards to claims 2 and 3, it would have been obvious to one of ordinary skill in the art that it is desired to adjust the density so that the preforms float in the slag. The preforms create the effect of the foaming within the slag, and so one would want

them to float within the slag to create the foaming slag effect. Furthermore, one would want to adjust the density of the preforms so that they float in the slag near the phase boundary between the melt and the slag in order to get a full effect of foaming slag, not a partial effect where only the surface of the slag foams.

In regards to claim 4, Görnerup's (A1) doping agent mentioned previously in a response to claim 1, is an iron carrier (p. 8, li. 31-34). It would have been obvious to one of ordinary skill in the art to include the iron carrier in the mixture of metallic oxide and carbon, as this is simply the combination of prior art elements according to known methods to yield predictable results.

In regards to claims 5 and 6, it would have been obvious to one of ordinary skill in the art that it is desired to adjust the density so that the preforms disintegrate in the slag uniformly and slowly and the evolution of gas occurs uniformly and over a relatively long period of time as in claim 5, and with a time delay, as in claim 6. These are desired in order to encourage the actual formation and maintenance of an active amount of foam as described in the Görnerup reference (p. 2, li. 28-32).

In regards to claim 9, Görnerup's (A1) doping agent mentioned previously in a response to claim 1, contains Silicon (p. 8, li. 31-34). It would have been obvious to one of ordinary skill in the art to include the silicon in the mixture of metallic oxide and carbon, as this is simply the combination of prior art elements according to known methods to yield predictable results.

In regards to claim 10, Görnerup (A1) teaches that the doping agent mentioned previously in a response to claim 1, may be introduced to the furnace via furnace wall or

furnace roof (p. 5, li. 21-23). This being the case, it would have been obvious to one of ordinary skill in the art that the performs of the mixture of metallic oxide and carbon be introduced via furnace wall or roof due to the combination of prior art elements according to known methods to yield predictable results.

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Görnerup (A1) as applied to claim 1 above, and in view of Calderon (US6214085 hereinafter A2).

In regards to claim 7, while Görnerup (A1) does not teach the addition of limestone to the mixture, Calderon (A2) teaches the use of limestone as a flux. It would have been obvious to one of ordinary skill in the art to modify Görnerup (A1) with the limestone taught by Calderon (A2) in order to promote fusion between the elements and alloys of the mixture.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Görnerup (A1) as applied to claim 1 above, and in view of Faust (US 3,843,767 hereinafter A3).

In regards to claim 8, while Görnerup (A1) does not teach the addition of calcium fluoride to the mixture, Faust (A3) teaches the use of calcium fluoride as a flux. In that a flux promotes fusion between the elements and alloys of the mixture, it is interpreted to be a slag thinner. It would have been obvious to one of ordinary skill in the art to modify Görnerup (A1) with the calcium fluoride taught by Calderon (A2) in order to promote fusion between the elements and alloys of the mixture.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Görnerup (A1) as applied to claim1 above, and in view of Guillot (US6228137 hereinafter A4).

In regards to claim 11, while Görnerup (A1) does not teach the limitations of the instant claim, Guillot (A4) teaches the foamed slag to coat the end of the electrode (col. 1, li. 29-33). Being the case that it is the reduction of oxide by the carbon which creates the foam, it would have been obvious to one of ordinary skill in the art that it is preferable that the mixture be introduced into the slag in a directed way in the vicinity of or directly at the hot spots of the electrodes, as the coating of the electrodes with the foam "protects the refractories from the electric radiation, and this allows a saving, in the consumption of the electrode, in electricity consumption and in the consumption of the refractories (col. 1, li. 29-33)". This being the case, it would have been obvious to one of ordinary skill in the art to modify Görnerup (A1) with the teachings of Guillot (A4)

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTINE CHEN whose telephone number is (571)270-3590. The examiner can normally be reached on Monday-Friday 8:30am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571) 272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CC

/Vickie Kim/
Supervisory Patent Examiner, Art Unit 4116